

# *Stafford Regional Airport*

## **Compatible Land Use Study**

**DRAFT**



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## **1.0 Preface**

The Stafford Regional Airport, located near Fredericksburg, Virginia and the southern boundary of Stafford County, Virginia, is situated approximately 40 miles southwest of Washington D.C., 50 miles north of Richmond Virginia and approximately 5 miles north of Fredericksburg, Virginia. The Airport began operation in December 2001 and has seen continual growth. When it was initially sited in 1987, the surrounding area was primarily agricultural and rural residential with very low density housing. In 2006, the Centerport Parkway (Interstate 95 Exit 136) was constructed with the intent of developing a technology and business park (Pemberton Project, as an example) adjacent to and complementing the airport. It is imperative to protect this regional resource by ensuring compatible development, land use, and zoning adjacent to and around the Airport.

## **2.0 Airport History**

The need for a new public general aviation airport in Stafford County was determined in 1972 as part of the National Airport System Plan. In 1977 Stafford County conducted a feasibility study which detailed a need for a transport category airport in the region. A series of environmental studies were conducted between 1977 and 1992 and resulted in the final selection of an airport site in the central Stafford County area, adjacent to Interstate 95. Construction of the Airport began in 1997 and the airport opened in December 2001. The Airport was completed for just over \$41M dollars, \$5M under its allocated budget. This included an investment of \$820k from the Stafford Regional Airport Authority, almost \$39M from the Federal Aviation Administration (FAA) and approximately \$1.25M in Commonwealth of Virginia funding. “It (the airport sponsor) will take the appropriate action, to the extent reasonable, including the adoption of zoning laws, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations, including landing and takeoff of aircraft.” (FAA Airport Sponsor Grant Assurances 3/2014)

Significant airport development of more than \$14M has occurred since the Airport was originally constructed with the bulk coming from the FAA. This construction includes the addition of T-Hangars, two corporate hangars, apron areas, auto parking, fuel farm, security fencing, an instrument landing system (ILS), an approach lighting system and a new terminal building that opened in January 2014. The FAA and DOAV provide nearly all of the funding for future airport improvements and it is imperative that Stafford County establish and maintain high quality development compatibility standards to insure that future expenditures are used to improve the airport instead of noise abatement measures due to poor development planning.

The Airport is governed by a seven member Airport Authority (Stafford Regional Airport Authority or SRAA). These appointed members serve four year terms and represent Stafford

County (four members), Prince William County (two members), and the City of Fredericksburg, Virginia (one member). A fulltime airport manager is located at the Stafford Regional Airport and handles the daily operation of the facility.

The Stafford Regional Airport service area includes Stafford County and portions of eight surrounding counties plus the City of Alexandria and Washington D.C. as determined by the Virginia Department of Aviation (DOAV) 2003 *Virginia Air Transportation System Plan* (VATSP) and airport records.

The Stafford Regional Airport is served by a single 5,000' x 100' grooved runway (15-33) as shown on the Airport Layout Plan in **Exhibit 1**. This runway is oriented 150 and 330 degrees and has a full-length parallel taxiway. Runway 15-33 utilizes High Intensity Runway Lights (HIRL) which can be operated by pilots using the Airport's Unicom frequency (122.725). Medium Intensity Taxiway Lighting (MITL) is also available to pilots to assist in night operations, giving the facility 24-hour operational capability.

The Stafford Regional Airport currently has three instrument approach procedures consisting of an ILS approach, VOR approach, and a GPS approach. The ILS is an Instrument Landing System which uses radio waves broadcast from the Airport to align aircraft with the approach path to the runway. Runway 33 at the Airport has a Category 1 ILS System which enables aircraft with IFR (Instrument Flight Rules) equipment to land at RMN in inclement weather. Non-Precision instrument approaches (GPS or RNAV) for runway 15 have been developed and reviewed by the FAA but not implemented at this time.

Aircraft operating at the Stafford Regional Airport use existing traffic patterns based on the type and speed of the aircraft. The Airport operates with a standard left-hand traffic pattern for runway 33 and a nonstandard right-hand pattern for runway 15 as shown in **Exhibit 2**. This nonstandard pattern was implemented due to the proximity of a landfill which can serve as a bird attractant. Future plans call for implementing a standard left-hand traffic pattern on Runway 15 once the closest landfill cell to the Airport is closed as shown in **Exhibit 3**.

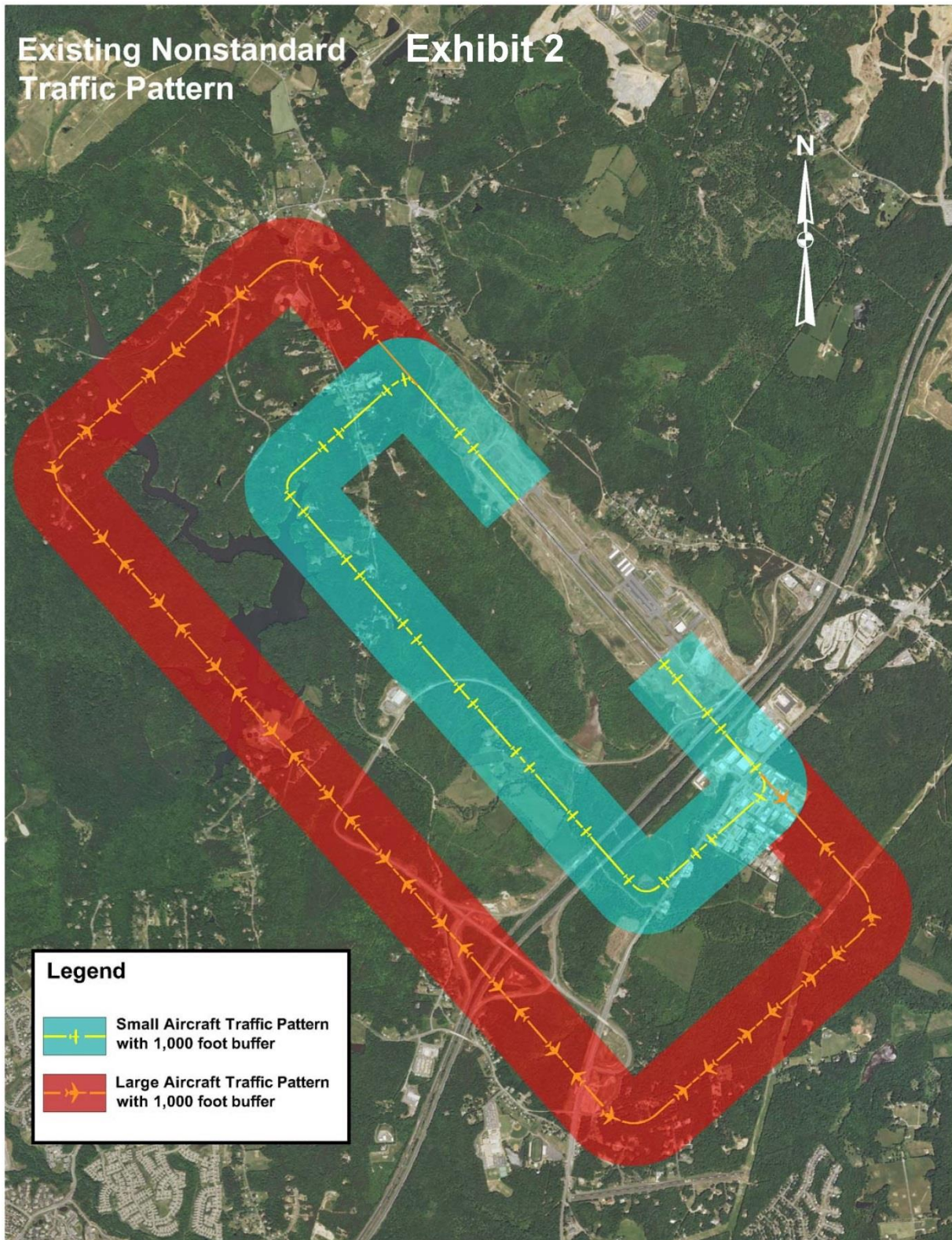
An operation is defined as either a takeoff or a landing at the airport. Existing airport activity exceeds 23,000 operations per year and a modest growth rate of approximately 1,000 operations per year for the next several years is projected. This figure is supported by the FAA and DOAV as indicated in the approved Airport Master Plan update that was completed in April 2013.

According to the 2011 Virginia Statewide Economic Impact Study, the Stafford Regional Airport provided 105 direct and indirect jobs and contributed \$18.2M in economic activity to the region in 2010. This impact demonstrates the value that the Stafford Regional Airport adds to the region as an economic engine.

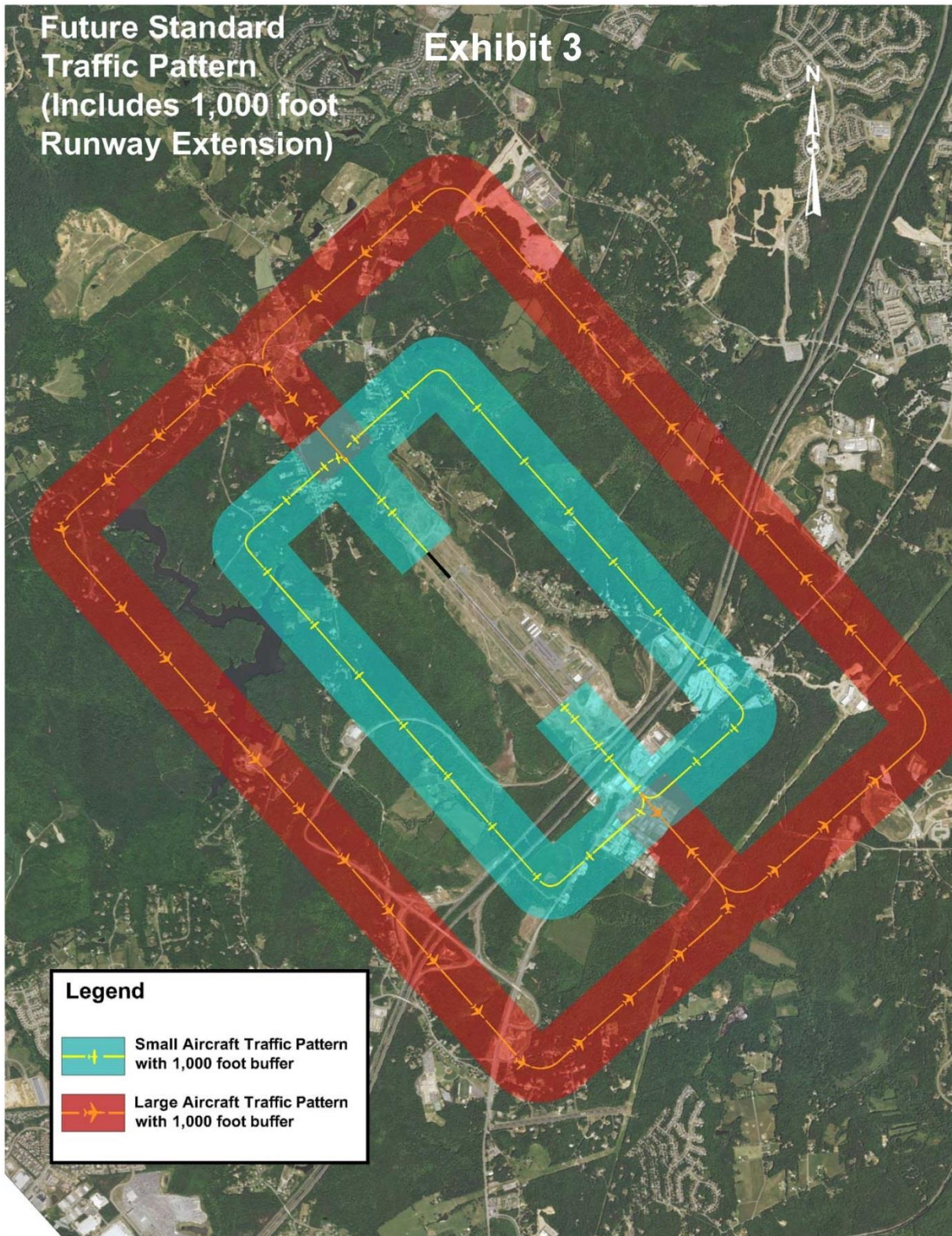












### **3.0 Compatible Land Use**

Historically, airports and surrounding residential buildup do not mix well. There are numerous examples where an existing airport has been closed, threatened, or its operations curtailed by nearby residents and their concerns over airport noise and safety. New airports are sited away from non-compatible land uses such as high-density residential developments. Residential zoning may encroach on an existing airport over time, often resulting in constraints on airport operations or outright closing of these public facilities. It is therefore incumbent on land use planners to resist the temptation to allow dense residential zoning, high-rise buildings, towers, or schools in close proximity to an existing airport in order to preserve and protect the significant public investment that an airport represents.

The FAA Compatible Land Use Planning Taskforce states: “The development of land uses that are not compatible with airports and aircraft noise is a growing concern across the country. In addition to aircraft noise, there are other issues, such as safety and other environmental impacts to land uses around airports which need to be considered when addressing the overall issue of land use compatibility. Although several federal programs include noise standards or guidelines as part of their funding-eligibility and performance criteria, the primary responsibility for integrating airport considerations into the local land use planning process rests with local governments. The objectives of compatible land use planning are to encourage land uses that are generally considered to be incompatible with airports (such as residential, schools, and churches) to locate away from airports and to encourage land uses that are more compatible (such as industrial and commercial uses) to locate around airports. The FAA has been actively supporting programs to minimize noise impacts. These include phase out of noise aircraft, supporting airport noise compatibility programs, and funding of mitigation measures in environmental studies. Historically land use plans (comprehensive plans) prepared by local governments have only minimally recognized the implications of planning for airports and off-site, airport-related development. Local land use planning, as a method of determining appropriate (and inappropriate) use of properties around airports should be an integral part of the land use policy and regulatory tools used by airports and local land use planners.” (FAA Compatible Land Use Planning Taskforce, 1998)

“Land use decisions that conflict with aviation activity and airport facilities can result in undue constraints being placed on an airport. In order to enable this sector of the economy to continue to expand, to provide for a wide variety of job opportunities for local citizens, and to meet the needs of the traveling public, it is vitally important that airports operate in an environment that maximizes the compatibility of the airport with off-airport development.” (FAA Compatible Land Use Planning Taskforce, 1998)

“Most commercial and industrial uses, especially those associated with the airport, are good neighbors to airports. Land uses where the airport creates the demand, such as motels, restaurants, warehouses, shipping agencies, aircraft-related industries, and industries that benefit from the access to an airport, are compatible land uses.” (FAA Compatible Land Use Planning Taskforce, 1998)

“Other uses that may be compatible with airports are farms, large parks, conservatory areas, and other open spaces. These land uses are created for public purposes and are opportunities for local government bodies to provide facilities that serve another public purpose to protect airport operations. Forestry service, landscape services, golf courses, and some extractive industries such as mining and excavations are also compatible with airports. Agriculture is another land use that is compatible with airport operations as long as the use is not a wildlife attractant. Agricultural use of land near an airport permits the owner of the property to efficiently use land while providing an additional benefit to the community for airport protection.” (FAA Compatible Land Use Planning Taskforce, 1998)

Residential development is not compatible with airport operations due to aircraft noise impacts and for safety reasons. Incompatible land uses around airports jeopardize the safety and efficiency of flying activities, and the quality of life of the community's residents. Incompatible airport land uses include residential development, schools, community centers and libraries, hospitals, and buildings used for religious services and tall structures, smoke and electrical signal generators landfills and other bird/wildlife attractants.

Some types of compatibility conflicts between airports and land uses are obvious. Houses and schools, for example, are generally incompatible near airports for reasons of noise, safety, fumes, vibration, and low-flying aircraft. Others are not as readily recognized or understood including uses that concentrate people in locations where aircraft accident risks are greatest, tall structures that impinge upon airport airspace, or features that attract birds or animals to areas where aircraft operate. Some examples of the obvious and not-so-obvious compatibility conflicts are listed in Table 1 (WSDOT Airports and Compatible Land Use Guidebook, January 2011).



<p align="center"><b>Table 1</b> <b>Compatibility Concerns Represented by Particular Land Uses</b></p>	
<b>Land Use Type</b>	<b>Compatibility Concerns</b>
<b>Single-Family Residential</b>	Noise can be disruptive in outdoor areas as well as indoors with open windows. Aircraft overflight can be annoying, especially where ambient noise levels are low such as in suburban or rural areas.
<b>Multi-Family Residential</b>	Noise can be disruptive in outdoor areas as well as indoors with open windows, although less sensitive than for single-family residential. High density presents concern for safety of residents in areas exposed to significant risk of aircraft accidents.
<b>Schools K-12</b>	Noise can disrupt the learning environment. Special concerns for safety of children in areas exposed to significant risk of aircraft accidents.
<b>Hospitals/Nursing Homes</b>	Special concerns for safety of patients and the elderly in areas exposed to significant risk of aircraft accidents.
<b>Retail Centers</b>	Large numbers of people could be at risk from aircraft accidents if the use is located in areas exposed to high levels of aircraft accidents.
<b>Business Parks</b>	Safety concerns for places with high-intensity uses. Tall buildings can be airspace obstructions.
<b>Assembly Facilities</b>	Large numbers of people could be at risk from aircraft accidents; outdoor stadiums have greatest exposure.
<b>Industrial Uses</b>	Smoke, steam, and thermal plumes can be hazards to flight. Tall structures can be airspace obstructions. Possible release of hazardous materials if damaged during an accident.
<b>Agricultural Uses</b>	Potential wildlife attractants as well as a source of dust and smoke.
<b>Water/Natural Areas</b>	Potential wildlife attractants.
<b>Power Plants</b>	Smoke, steam, and thermal plumes can be hazards to flight. Tall structures can be airspace obstructions. Potential disruption of service if damaged during an accident.
<b>Critical Community Infrastructure</b> (emergency services and communications)	Potential disruption of service if damaged during an accident.

Source: Washington State Department of Transportation Airports and Compatible Land Use Guidebook, January 2011

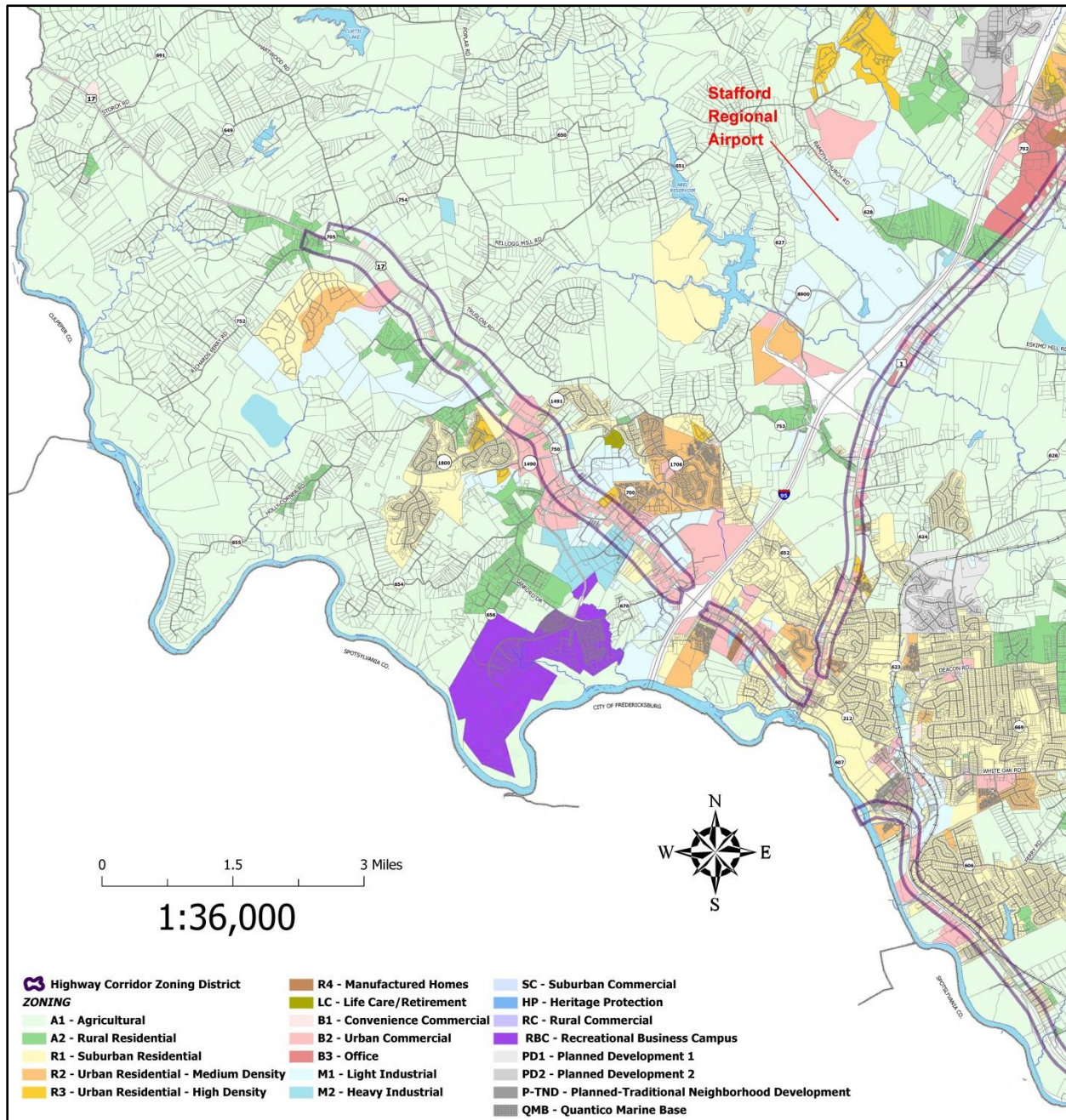
#### **4.0 Existing Land Use and Zoning**

The land currently located around the Stafford Regional Airport is zoned as light industrial and rural residential with the airport property designated as light industrial (**Exhibit 4**). Low density residential areas are located approximately 1,000 feet north of the Airport as shown in the current Land Use Map in **Exhibit 5**. There are a number of homes located within the surrounding area. These homes are not clustered and fall within the definition of rural land use. The proposed 1,000-foot runway extension will include the addition of airport property which should also be designated as industrial.

Stafford County has enacted a zoning overlay district for the Stafford Regional Airport. This zoning overlay protects the airspace and approaches around the airport by limiting the height of objects within this airspace (Chapter 28. Article IV. Sec. 28-64). The ordinance states: “The AD overlay district is established in furtherance of the purpose set forth in Section 15.2-2294, Code of Virginia 1950, as amended, and in general to regulate and restrict the height of structures and objects or natural growth, and otherwise regulate the use of property in the vicinity of general aviation airports in the County of Stafford by creating appropriate zones and establishing boundaries thereof. It is further the intent of this chapter to regulate potential obstructions of any airport zone. It is hereby found that an obstruction has the potential for endangering the lives and property of users of the airports and residents in the County of Stafford; and that an obstruction may reduce the size of areas available for landing, takeoff, and maneuvering of aircraft, thus tending to destroy or impair the utility of the airports and the public investment therein.”

## Exhibit 4

### Existing Stafford County Zoning

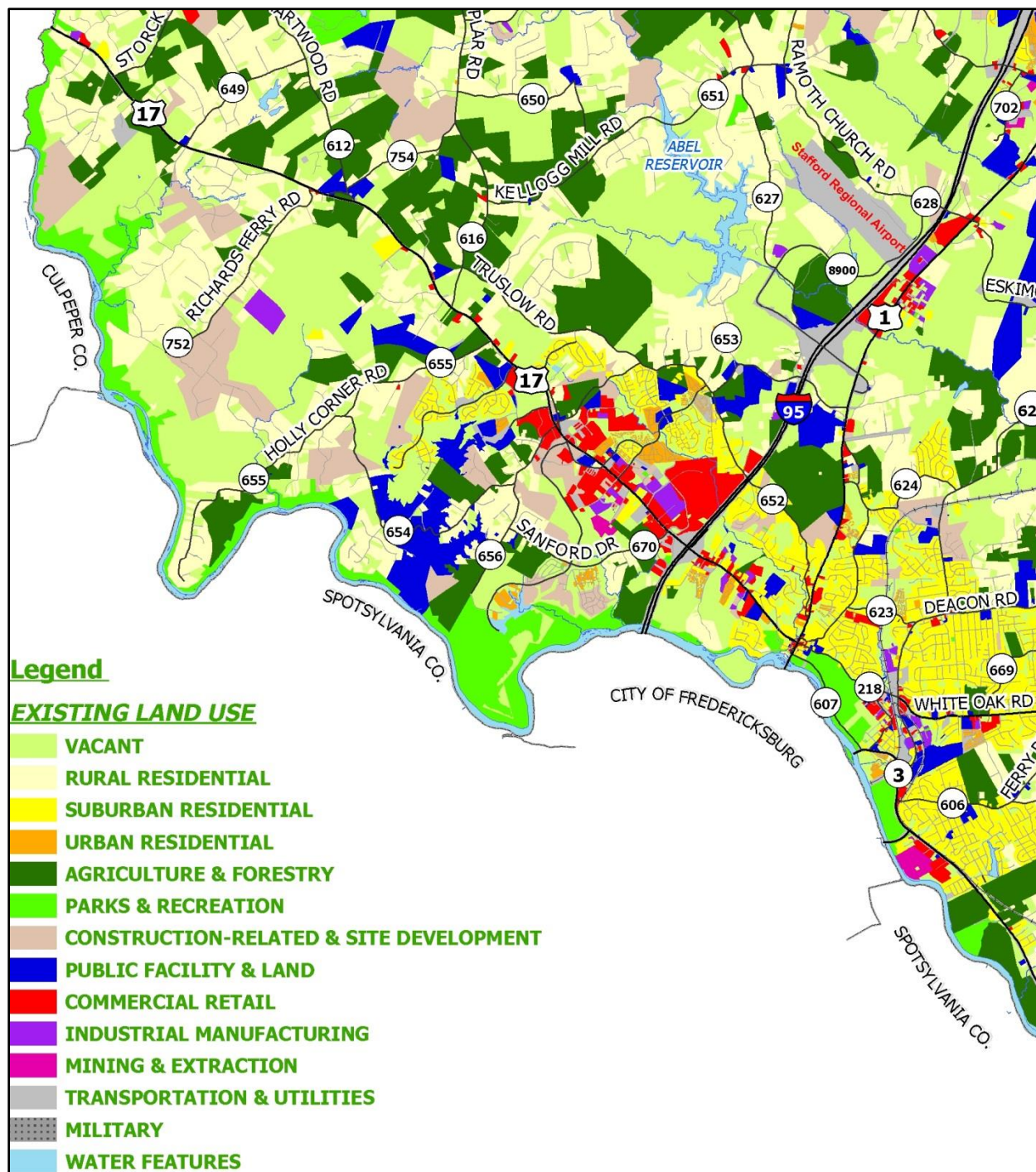


Source: Stafford County Comprehensive Plan 2010-2030



## Exhibit 5

### Existing Stafford Land Use



Source: Stafford County Comprehensive Plan 2010-2030

The various district boundaries are illustrated in **Exhibit 6** and each represent different elevations and gradients depending upon their proximity to the runway. The closer the district is to the runway, the lower the height of the surface. These districts are described in detail below:

**Airport zone.** An area that is centered about the runway and primary surface, with the floor set by the horizontal surface.

**Approach zone.** The inner edge approach zone coincides with the width of the primary surface and begins two hundred (200) feet from each runway. The south approach zone slopes fifty (50) feet outward for each one foot upward beginning at the end of and at the same elevation as the primary surface and extending to a horizontal distance of ten thousand (10,000) feet along the extended runway centerline. The north approach zone slopes thirty four and one tenth (34.1) feet outward from each one foot upward, beginning at the end of and at the same elevation of the primary surface and extending to a horizontal distance of ten thousand (10,000) feet along the extended runway centerline. The inner dimension is one thousand (1,000) feet and the outer dimension is four thousand (4,000) feet.

**Conical zone.** The area that commences at the periphery of the horizontal zone and extends outward there from for a distance of four thousand (4,000) feet.

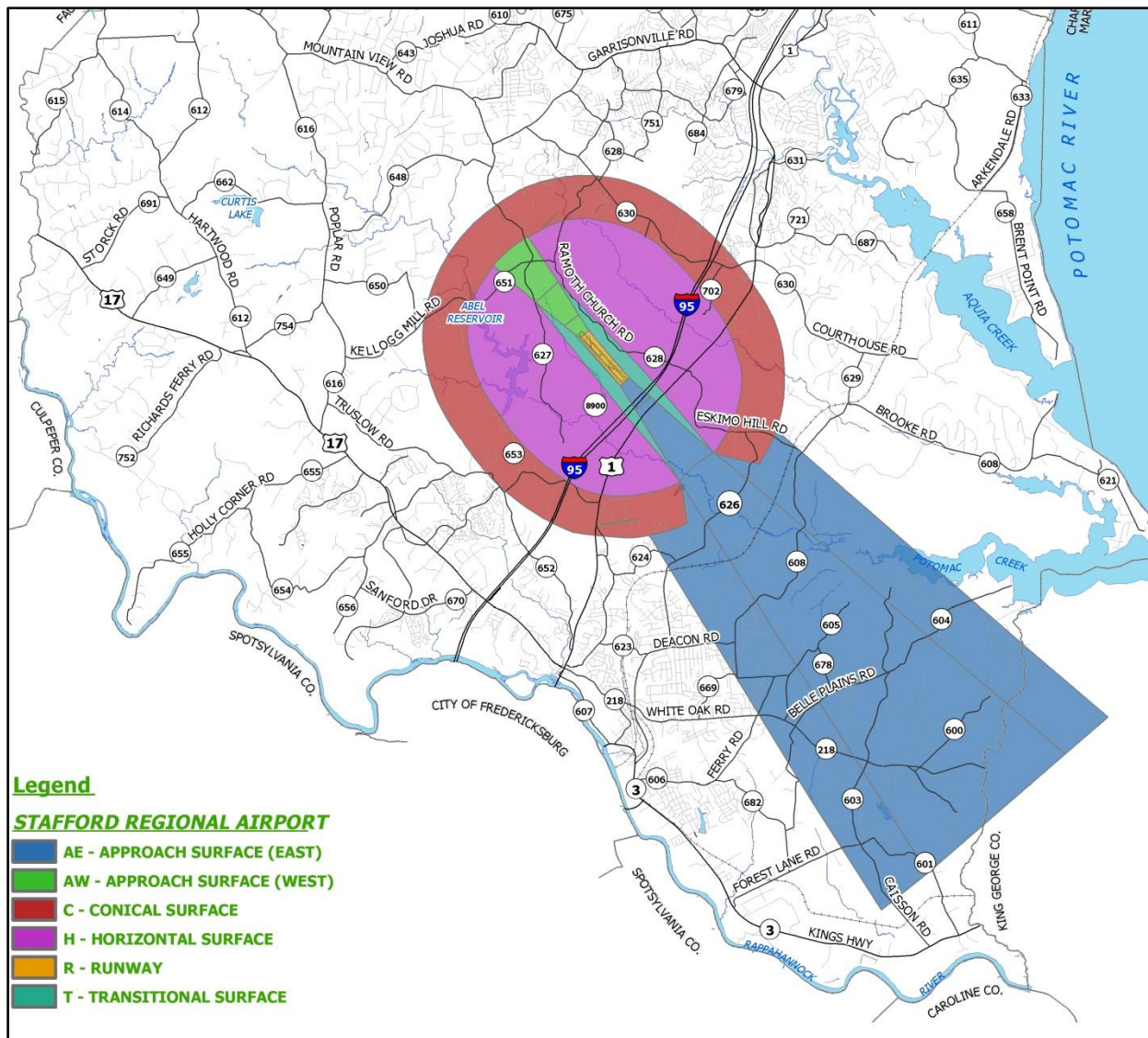
**Horizontal zone.** The area that is established by swinging arcs of ten thousand (10,000) feet radii from the center of the end of the primary surface of an airport runway and connecting adjacent arcs by drawing lines tangent to those areas. The horizontal zone does not include the approach and transitional zones.

**Runway clear zone.** The area that begins at the end of the primary surface on the runway ends and extends, with the width of each approach surface defined in part 77.25D, subchapter E (Airspace), of title [14] of the Code of Federal Regulations, or in successor federal regulations. The clear zone on the north end of the runway is one thousand (1,000) feet wide where it connects to the primary surface and one thousand five hundred (1,500) feet wide at its northern edge and it extends south/north one thousand seven hundred (1,700) feet. The clear zone on the south end of the runway is one thousand (1,000) feet wide where it connects to the primary surface and one thousand seven hundred fifty (1,750) feet wide at its southern boundary and it extends north/south two thousand five hundred (2,500) feet.

**Transitional zone.** The area that fans away perpendicular to any airport runway centerline and approach surfaces, with the floor elevation set by the transitional surfaces.

## Exhibit 6

### Stafford Regional Airport Impact Overlay District



Source: Stafford County Zoning Ordinance, (Chapter 28. Article IV. Sec. 28-64.)



## 5.0 Recommendations

Stafford County should endeavor to maintain the area surrounding the Airport as industrial and limit the development of this area with non-airport compatible uses such as residential areas, churches, or schools. The additional development of the Airport should serve as a catalyst for the attraction of industry and the creation of more employment opportunities for the area. It is important for the land surrounding an airport to be used in a manner which is compatible with the airport operations. Ideally, residential development is discouraged from land surrounding airports due to safety and noise considerations.” (Talbert and Bright, Inc, 2013)

The Stafford County Comprehensive Plan 2010-2030 enumerates several policies and plans that speak to airport compatibility. Policy 4.9.1 states: “The County should develop land use compatibility standards for new development to conform to within the aircraft approach patterns of airports and landing strips.” Policy 6.2.5 also provides guidance that the County will...”Continue to support the development of the Stafford Regional Airport to serve economic development interests.” Under the Comprehensive Plan Implementation Plan, one of the goals under the Public Safety section is to: “PS3) Amend the Zoning Ordinance to establish land use compatibility standards in approach patterns to airports to minimize land use conflicts regarding safety and noise (4.9.1).” Figure 6.17 in the Comprehensive Plan is the adopted Airport Impact Zone for Stafford Regional Airport and it is based on the FAR Part 77 definitions that delineate areas for vertical obstructions but does not speak directly to other noise and vibration impacts within that overlay district. Lastly, in the Implementation Plan, the timetable set for establishing compatible land use standards around airports was listed in the Action List Timeline as December 2013 and that has now passed without these plans and standards being established.

The Stafford Regional Airport Authority recommends that Stafford County enact the policies described above as determined from the Stafford County Comprehensive Plan, specifically, Policy 4.9.1. The existing airport overlay district ordinance should be amended to include compatible, potentially compatible, and incompatible zoning classifications. These classifications are listed in Table 2. Compatible zoning classifications are consistent with FAA guidelines.

Compatible Zoning Classifications would allow development within the Airport Overlay District. Potentially Compatible Zoning Classifications would be evaluated on a case-by-case basis with the Stafford County Planning and Zoning Department. Incompatible Zoning Classification include uses which would likely conflict with airport operations and would result in adverse quality of life impacts.

Stafford County should also endeavor to restrict Conditional Use Permits within the Airport Overlay District to development that is compatible with airport operations. The following types

of development require a conditional use permit from Stafford County and may be incompatible with the Stafford Regional Airport.

- Child care center
- Hotel/motel
- Nursing home
- School
- Turkey shoot

Any CUP applications submitted to Stafford County that include these uses and fall within the Airport Overlay District should be evaluated on a case-by-case basis to determine their potential impact on the Stafford Regional Airport. Manufacturing facilities which generate steam that fall within the Airport Overlay District should also be discouraged as these facilities may cause visibility issues for pilots operating at the Airport.

<b>Table 2</b> <b><i>Recommended Airport Overlay District Zoning Classifications</i></b>		
<b>Compatible Zoning Classifications</b>	<b>Potentially Compatible Zoning Classifications</b>	<b>Incompatible Zoning Classifications</b>
A-1 Agricultural	R-1 Suburban Residential	R-3 Urban Residential - High Density
A-2 Rural Residential	R-2 Urban Residential - Medium Density	LC Life Care/Retirement Community
B-1 Convenience Commercial	R-4 - Manufactured Homes	UD Urban Development
M-1 Light Industrial	B-2 Urban Commercial	P-TND Planned Traditional Neighborhood Development
M-2 Heavy Industrial	B-3 Office	
RC Rural Commercial	HI Heritage Interpretation	
	SC Suburban Commercial	
	RBC Recreational Business Campus	
	PD1 Planned Development 1	
	PD2 Planned Development 2	